Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

Natural Sciences and Engineering Research Council of Canada / Conseil de recherches en sciences naturelles et en génie du Canada

Social Sciences and Humanities Research Council of Canada / Conseil de recherches en sciences humaines du Canada

The Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Social Sciences and Humanities Research Council of Canada (SSHRC) are federal agencies that support research and research training in Canadian postsecondary institutions and research hospitals. We invest in the best research and brightest minds, and facilitate knowledge translation and mobilization, social innovation and commercialization. We provide leadership for Canada's research community, and work to position the future of Canadian research and innovation internationally – for the benefit of Canadians.

Creating Canada's Future: Investing in Research for Impact Today and Tomorrow

Introduction

> *Our country is rightfully proud of the many contributions made by our scientific researchers to the expansion of human knowledge. They have developed technologies that have improved quality of life for hundreds of millions of people all over the world. And Canadians have always aspired to lead in the pursuit of progress.* – Prime Minister Stephen Harper, July 2010

One of the lessons of the global financial crisis is that government policies matter. As the world begins to emerge from the most serious recession since the Great Depression, Canada's fiscal position is recognized as one of the strongest in the world[1]. There are promising signs of recovery, due in large measure to the foresight behind government policies that supported a sound financial sector, coupled with an aggressive economic stimulus package that included continued investments in research, technology and infrastructure at colleges, universities, federal laboratories and research facilities.

Canada's substantial investments in research and postsecondary education are paying off. Canadian researchers are at the forefront of important scientific developments in many fields. Canada ranks in the top 10 countries of the world in terms of number of scientific publications[2], and we lead the G8 in terms of scientific output per capita[3]. The momentum in Canada's research, training and innovation capacity is enabling the attraction and retention of some of the world's top minds through programs such as the Vanier Canada Graduate Scholarships, the new Banting Postdoctoral Fellowships and the prestigious Canada Excellence Research Chairs. The Government of Canada's

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[1] Remarks by Mark Carney, Governor of the Bank of Canada, to the Winnipeg Chamber of Commerce, Winnipeg, Manitoba 4 February 2010: http://www.bankofcanada.ca/en/speeches/2010/sp040210.html

[2] http://www.conferenceboard.ca/hcp/details/innovation/scientific-articles.aspx

[3] http://www.conferenceboard.ca/hcp/details/innovation/scientific-articles.aspx

demonstrated commitment to investment in talent, innovation and research, especially in times of economic restraint, will prove key to the long term prosperity of Canada.

To compete globally, we must use our resources wisely, with unwavering commitment to talent and excellence. CIHR, NSERC and SSHRC play key roles in Canada's progress towards achieving a strong economy with productive industries, vibrant communities, and healthy citizens enjoying a clean and safe environment and excellent quality of life. We are committed to capturing every opportunity to maximize our impact on the life of our industries, communities and people. Our impact on the future is being written now. Consider the following initiatives where CIHR, NSERC and SSHRC are working together to find creative solutions for our future challenges:

- NSERC and CIHR are funding researchers across Canada from the health sciences, physics, chemistry and engineering in the quest for alternative radiopharmaceutical isotopes for medical imaging to replace Technetium-99m.

- SSHRC, NSERC, and CIHR are partnering with the International Development Research Centre to help vulnerable populations or sectors in Canada and in low and middle income countries adapt to climate change. The International Research Initiative on Adaptation to Climate Change brings together expertise from scientific, traditional knowledge, and indigenous perspectives to shape policy, provide training and inform practice.

IMPACT SPOTLIGHT: Partnering for technology commercialization in the theatre industry
The commercialization of a Canadian digital display technology received a boost with SSHRC funding. Researchers at the University of Waterloo's Canadian Centre for Arts and Technology have partnered with Christie Digital Systems of Kitchener to explore the use of digital display technologies in a new, non-traditional market: live theatre. Christie Digital's pre-market display technology is being "seeded" in the theatre industry, to study how best to transfer an emerging technology and commercialize it within an established cultural industry.

As we take steps to put this global recession behind us, we must keep a watchful eye on Canada's economy and those of our close neighbours and trading partners, and the world. The ability of Canada's research enterprise to exploit partnerships, attract and retain top global talent and invest in high-impact, world-class research will be crucial. These themes, developed below, are Canada's Advantage – our link to an innovative, productive and knowledge-based future.

Key Directions for Advancing Canada's Advantage

Recommendation 1: Support strategic partnerships connecting researchers with business, other sectors and society at large.

Effective partnerships are about leveraging the knowledge, creativity, strengths and resources of different partners toward the achievement of common goals.

Effective partnerships between the academic and private sectors connect researchers and scientists with business people so that new ideas and inventions generate tangible

benefits for society. We need to overcome the barriers that prevent Canada's excellent research from being commercialized into new Canadian products, services and processes. Building a strong interface between the university and the private, public and not-for-profit sectors is essential to accelerate the pace of discovery and commercialization and lever Canadian research efforts into successes in the global marketplace.

In recent years, CIHR, NSERC and SSHRC have each developed new initiatives focusing on strategic partnerships, seeking to increase the impact of research on communities, businesses and industries through new and innovative collaboration:

- *CIHR'S Strategy on Patient-Oriented Research*
  Canada's research community is uniquely positioned to supply the information needed to make the best possible decisions regarding treatment options and choices to be adopted in the health care system. Evidence is key to effective decision-making, which includes improving health outcomes and making cost-effective policy choices. Indeed, evidence-based practices can provide high standards of care while reducing disparities and costs.

  Canada must increase and better coordinate its investment and effort in patient-oriented research to improve the quality and cost-effectiveness of its health care system. CIHR has developed a national Strategy for Patient-Oriented Research with extensive input from stakeholders across the country. The Strategy will strengthen Canada's clinical research funding, environment and infrastructure, set up mechanisms to better train and mentor clinical researchers, streamline processes such as ethics reviews for multi-site studies, facilitate the uptake of best practices in health care, and accelerate the commercialization of innovations.

  IMPACT SPOTLIGHT: Helping forest companies tap into the emerging nano marketplace
  ArboraNano is a new Business-led Network of Centres of Excellence that is creating business opportunities for Canada through innovation. Canadian researchers and manufacturers are discovering new uses for nanocellulose, a major component of trees. Industries from aerospace and automotive to pharmaceutical and security are involved in collaborative efforts to use this versatile material to improve existing products and develop new ones.

  With partnership among academic healthcare and research institutions, clinical researchers, industry and provincial and territorial governments, the Strategy will promote the evaluation of new and current diagnostic approaches, treatments, devices and practices as well as integrate this new knowledge into the health care system.

- *SSHRC's new funding opportunities for Partnerships*
  SSHRC has just launched new flexible funding opportunities to enable postsecondary institutions and organizations from the private sector, government organizations, non-profit and community-based organizations to develop and sustain collaboration in research and knowledge mobilization. Formal partnerships across disciplines and sectors allow sustained work over several years on issues or opportunities of shared interest, with results benefiting users

within the partnership and beyond. SSHRC's new approach to partnerships allows for greater flexibility by applicants to design a partnership model most likely to produce valuable results for Canadians and provide training opportunities for students, while adhering to the highest standards of excellence. Within its new Partnerships opportunities, SSHRC has identified priority thematic areas such as Digital Media, and Innovation, Leadership and Prosperity, in order to support new cross-sectoral or interdisciplinary partnerships focused on areas of opportunity for Canada.

- *NSERC's Strategy for Partnerships and Innovation*
  Private-public sector partnerships generate the kind of innovation that leads to business growth, job creation and a stronger, more resilient economy. NSERC's new Strategy for Partnerships and Innovation builds on NSERC's current investments of approximately $300 million/year in partnered R&D. These lever more than $120 million annually from more than 1,500 Canadian companies. The Strategy aims to connect and apply the strengths of the post-secondary research system to industry for the benefit of Canadians. Designed to attract more Canadian companies to invest in R&D projects with Canadian universities and colleges, it will result in higher value products, processes and services produced in Canada.

  NSERC will also support large-scale efforts by leading research groups seizing exceptional opportunities to advance solutions to some of Canada's most challenging economic, environmental and social problems. The approach will be agile and flexible, as recently exhibited through the Automotive Partnership Canada initiative model. NSERC will work with partners to ensure that our research strength within all sectors is brought to bear on addressing national challenges and opportunities.

In addition to these examples, CIHR, NSERC and SSHRC will continue to support programs such as the Networks of Centres of Excellence and the Centres of Excellence for Commercialization and Research to close the innovation/productivity gap and increase the level of business investment in research and development, which is lagging significantly behind our competitors.

Recommendation 2: Attract and develop talented people to meet Canada's labour market needs.

The jobs of the future will be driven by talented, skilled and creative people who will commercialize innovative ideas and ensure long-term economic growth and an enviable quality of life for Canadians. The federal S&T Strategy recognizes that Canada needs to nurture and anchor more of its talent here in Canada, creating jobs for Canadians, and become a magnet for world-class talent from all over the world. The fastest-growing sectors of our economy are those relying on highly-skilled workers and "innovation generators": the service and health sectors, telecommunications and the biotechnology industries, and the sectors contributing to the digital economy.

SSHRC, NSERC and CIHR are committed to ensuring that programs such as the Canada Research Chairs, the Canada Excellence Research Chairs, the Vanier Canada Graduate Scholarships and the Banting Postdoctoral Fellowships augment Canada's pool of research talent and supply new and emerging areas of the labour market. We are

also working to strengthen linkages between postsecondary training and employers in all areas by better equipping students to translate research into practice in all sectors, increase an "employer-ready" focus in training programs, and engage with colleges. In light of the increasingly competitive global marketplace for talent, Canada must sustain its investments in programs to attract the world's best research talent, and ensure the continued renewal of Canada's research enterprise.

Recommendation 3: Maintain Canada's leadership position in research excellence.

World-class research with global impact underpins all that the federal research granting agencies achieve for Canada. Excellent research is also the foundation of training programs and partnerships that attract talent and achieve results. We need to benchmark our innovation and productivity, sector-by-sector, to the world's best.

The Government of Canada and CIHR, NSERC and SSHRC are committed to maintaining S&T leadership and excellence. The federal S&T Strategy articulated the vision of maintaining Canada's G-7 leadership in public R&D performance. New investments have resulted in higher-education institutions with the leading-edge research equipment and the facilities required to compete with the best. Canada is now a magnet for top talent. We must take full advantage of these assets and ensure that Canadians lead and are strong partners in international networks that address key challenges.

IMPACT SPOTLIGHT: Saving Lives on the Move
CIHR-funded Dr. Michel Le May of the Ottawa Heart Institute developed a new way for first responders to accurately diagnose and handle a type of heart attack called a ST-Elevation Myocardial Infarction (STEMI). The technique empowers paramedics to read electrocardiograms and identify patients with blocked arteries for fast-tracking to angioplasty surgery. As a result, a total of 2,000 STEMI patients have been treated at the Heart Institute since 2004, approximately 40% of whom were referred directly by paramedics. Research shows that in-hospital deaths at the Heart Institute dropped 50%, to less than 5% among patients suffering a STEMI.

While managing our investments wisely, we must sustain the momentum and better integrate the innovation system -- with more seamless access to research funding, including the indirect costs of research, greater inter-agency collaboration, and better inter-sectoral linkages. Our commitment to impact and excellence must remain uncompromised.

Sustaining investments for Canada's prosperity

We thank the Committee for last year's recommendations to increase support for the granting agencies and for the indirect costs program – recommendations that were reflected in Budget 2010. As our post-recession future unfolds, Canada's strong economic position enables us to accelerate our drive to compete globally. Our future prosperity depends upon today's action. We must partner the powerful generators of new ideas with the creators of new products and services. We must continue to attract top research talent to Canada. And we must ensure that top talent remains anchored in Canada by the quality of our research enterprise and the opportunity for innovation that we offer. We ask the Committee to continue to recognize, as it has in the past, the long-

term value of investments in Canada's research enterprise. Sustaining this support is critical to Canada's prosperity.